UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,357	10/20/2003	L. Robert Deardurff	1-36728	4378

43935 7590 10/04/2007

FRASER CLEMENS MARTIN & MILLER LLC
28366 KENSINGTON LANE
PERRYSBURG, OH 43551

EXAMINER	
DANIELS, MATTHEW J	
ART UNIT	**PAPER NUMBER**
1732	

NOTIFICATION DATE	DELIVERY MODE
10/04/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

miller@fraser-ip.com
sloan@fraser-ip.com
crooks@fraser-ip.com

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/689,357
Filing Date: October 20, 2003
Appellant(s): DEARDURFF, L. ROBERT

Donald R. Fraser
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 8 May 2007 appealing from the Office action mailed 8 February 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,622,001	BRIGHT et al.	11-1986
5,411,686	HATA	5-1995
4,988,279	BELCHER	1-1991
4,642,043	SCHWARZKOPF	2-1987

6,320,014 TAKAHASHI et al. 11-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

Rejections over Bright

Claims 1-3 and 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bright (USPN 4622001) in view of Hata (USPN 5411686).

As to Claim 1, Bright teaches a process for preparing an article which could be used as a blow molding preform (entire document), comprising:

melting polymer in a plasticating extruder, to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder (1:55-57);

cooling the polymer melt stream by heat exchange with a liquid heat transfer medium (2:1-15); and

forming the cooled polymer melt into a blow molding preform (2:6, the article of Bright is capable of being used as a blow molding preform).

Bright is silent to (a) flakes of polymer, (b) a screw extruder, and (c) cooling the melt stream to a temperature at least 20 degrees Centigrade below the extruder discharge temperature. However, these aspects would have been prima facie obvious for the following reasons:

(a) Hata teaches feedstock which is interpreted to be flakes (Fig. 16, Item 8), which is a well known method of delivering feedstock

(b) Hata teaches a screw extruder (Fig. 16), which is a well known method of melting and delivering polymer

(c) Bright teaches that the mold (Fig. 1, Item 50), and the nozzle leading to the mold (Fig. 3, Item 92), are each cooled with a heat transfer liquid being maintained at a temperature of less than 10 degrees C (1:63-68). Because the heat transfer liquid is at a temperature significantly lower than the melt, it is the Examiner's position that a temperature drop of at least 20 degrees Centigrade during flow of material *into and through* the cooled mold would have been an implicit aspect of Bright's invention.

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Hata into that of Bright because pellets or "flakes" would fit well into the hopper or feedstock inlet, and because Bright clearly suggests plasticating the mixture, which Hata's method would achieve. **As to Claims 2 and 3**, Bright teaches PET (1:55). **As to Claims 5 and 6**, Bright teaches above about 275 degrees C (1:57). **As to Claim 7**, Bright teaches a process for preparing an article which could be used as a blow molding preform (entire document), comprising:

melting polymer comprising polyethylene terephthalate (1:55), in a plasticating extruder to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder (1:57-58), the temperature of the polymer melt at the discharge of the extruder being about 275 degrees C (1:57);

cooling the polymer melt stream by heat exchange with a liquid heat transfer medium (1:63-2:15); and

forming the cooled polymer melt into a blow molding preform (2:6, the article is inherently capable of being used as a blow molding preform).

Bright is silent to (a) flakes of polymer, (b) a screw extruder, and (c) cooling the melt stream to a temperature at least 20 degrees Centigrade below the extruder discharge temperature. However, these aspects would have been prima facie obvious for the following reasons:

(a) Hata teaches flakes (Fig. 16, Item 8), which is a well known method of delivering feedstock

(b) Hata teaches a screw extruder (Fig. 16), which is a well known method of melting and delivering polymer

(c) Bright teaches that the mold (Fig. 1, Item 50), and the nozzle leading to the mold (Fig. 3, Item 92), are each cooled with a heat transfer liquid being maintained at a temperature of less than 10 degrees C (1:63-68). Because the heat transfer liquid is at a temperature significantly lower than the melt, it is the Examiner's position that a temperature drop of at least 20 degrees Centigrade during flow of material *into and through* the cooled mold would have been an implicit aspect of Bright's invention.

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Hata into that of Bright because pellets or "flakes" would fit well into the hopper or feedstock inlet, and because Bright clearly suggests plasticating the mixture, which Hata's method would achieve. **As to Claim 8**, Bright teaches PET (1:55). **As to Claims 9**, Bright teaches above about 275 degrees C (1:57), which reads on the claimed temperature range. **As to Claim 10**, Bright teaches a process for preparing an article which could be used as a blow molding preform (entire document), comprising:

melting polymer comprising polyethylene terephthalate (1:55), in a plasticating extruder to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder (1:57-58),

the temperature of the polymer melt at the discharge of the extruder being about 275 degrees C (1:57);

cooling the polymer melt stream by heat exchange with a liquid heat transfer medium (1:63-2:15); and

forming the cooled polymer melt into a blow molding preform (2:6, the article is inherently capable of being used as a blow molding preform).

Bright is silent to (a) flakes of polymer, (b) a screw extruder, and (c) cooling the melt stream to a temperature at least 20 degrees Centigrade below the extruder discharge temperature. However, these aspects would have been prima facie obvious for the following reasons:

(a) Hata teaches flakes (Fig. 16, Item 8), which is a well known method of delivering feedstock

(b) Hata teaches a screw extruder (Fig. 16), which is a well known method of melting and delivering polymer

(c) Bright teaches that the mold (Fig. 1, Item 50), and the nozzle leading to the mold (Fig. 3, Item 92), are each cooled with a heat transfer liquid being maintained at a temperature of less than 10 degrees C (1:63-68). Because the heat transfer liquid is at a temperature significantly lower than the melt, it is the Examiner's position that a temperature drop of at least 20 degrees Centigrade during flow of material *into and through* the cooled mold would have been an implicit aspect of Bright's invention.

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Hata into that of Bright because pellets or "flakes" would fit well into the hopper or feedstock inlet, and because Bright clearly suggests plasticating the mixture, which Hata's method would achieve.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bright (USPN 4622001) in view of Hata (USPN 5411686) and further in view of Takahashi (USPN 6320014). Bright and Hata teach the subject matter of Claim 1 above under 35 USC 103(a).

As to Claim 4, Bright appears to be silent to the claimed particle size. The Examiner asserts that in this case the size of the particle fed into a melt extruder does not materially affect the claimed process, and that any particle size would have been prima facie obvious to the ordinary artisan. However, Takahashi also teaches pellets having an average diameter of 5 mm comprising polyethylene terephthalate (10:10-15). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Takahashi into that of Bright in order to a) provide a dry feed line of material to an injection molding machine or extruder, b) provide pellets that are prevented from scorching, and c) to provide bottles of polyester having excellent properties such as high strength (All are found in Takahashi, 14: 49-62)).

Rejections over Belcher

Claims 1-3 and 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belcher (USPN 4988279) in view of Schwarzkopf (USPN 4642043).

As to Claim 1, Belcher teaches a process for preparing a blow molding preform (4:16-27), comprising:

melting polymer flakes (12:20) in a plasticating screw extruder, to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder (2:41 and 4:1-5);

cooling the polymer melt stream at least 20 degrees C (4:7-10 or 11:10-15); and

forming the cooled polymer melt into a blow molding preform (disclosure in 4:16-23 is interpreted to be a preform, or alternatively see 11:14-15).

In one interpretation, Belcher is silent to (a) cooling after discharging from the extruder, and (b) cooling with a liquid heat transfer medium. However, these aspects would have been prima facie obvious for the following reasons:

(a) The particular order of cooling and discharging does not distinguish the invention from Belcher, who teaches cooling then simultaneous discharging and forming of the polymer into a tubular preform. The same temperature drop is provided, the only difference between the claimed order of steps.

(b) Schwarzkopf provides a liquid heat transfer medium for use in "synthetic resin processing machines" (1:17).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Schwarzkopf into that of Belcher because doing so would adjust the temperature actively by cooling so as to better maintain the material within the optimal and narrow temperature range (2:11-20).

In an alternate interpretation of Belcher's method, Belcher provides cooling after discharging from the extruder with a liquid heat transfer medium (See 11:10-20 and item 60 in the figures), which would implicitly cool the "polymer melt stream" to a temperature at least 20 C below the extruder temperature and form a preform (11:14).

As to Claims 2 and 3, Belcher teaches PET (4:1-30). **As to Claims 5 and 6**, Belcher teaches 260-290 C (4:5). **As to Claim 7**, Belcher teaches a process for preparing a blow molding preform (4:16-27), comprising:

melting polymer flakes of PET (12:20) in a plasticating screw extruder, to prepare a homogeneous stream of hot polymer melt at a temperature of 260 C to 290 C (2:41 and 4:1-5);

cooling the polymer melt stream at least 20 degrees C (4:7-10); and

forming the cooled polymer melt into a blow molding preform (disclosure in 4:16-23 is interpreted to be a preform).

Belcher is silent to (a) cooling after discharging from the extruder, and (b) cooling with a liquid heat transfer medium. However, these aspects would have been prima facie obvious for the following reasons:

(a) The particular order of cooling and discharging does not distinguish the invention from Belcher, who teaches cooling then simultaneous discharging and forming of the polymer into a tubular preform. The same temperature drop is provided, the only difference between the claimed order of steps.

(b) Schwarzkopf provides a liquid heat transfer medium for use in "synthetic resin processing machines" (1:17).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Schwarzkopf into that of Belcher because doing so would adjust the temperature actively by cooling so as to better maintain the material within the optimal and narrow temperature range (2:11-20). **As to Claim 8**, Belcher teaches PET (4:1-30).

As to Claims 9, Belcher teaches 260 to 290 C (4:5). **As to Claim 10**, Belcher teaches a process for preparing a blow molding preform (4:16-27), comprising:

melting polymer flakes of PET (12:20) in a plasticating screw extruder, to prepare a homogeneous stream of hot polymer melt at a temperature of 260 C to 290 C (2:41 and 4:1-5);

cooling the polymer melt stream at least 20 degrees C (4:7-10); and

forming the cooled polymer melt into a blow molding preform (disclosure in 4:16-23 is interpreted to be a preform).

Belcher is silent to (a) cooling after discharging from the extruder, and (b) cooling with a liquid heat transfer medium. However, these aspects would have been prima facie obvious for the following reasons:

(a) The particular order of cooling and discharging does not distinguish the invention from Belcher, who teaches cooling then simultaneous discharging and forming of the polymer into a tubular preform. The same temperature drop is provided.

(b) Schwarzkopf provides a liquid heat transfer medium for use in "synthetic resin processing machines" (1:17).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Schwarzkopf into that of Belcher because doing so would adjust the temperature actively by cooling so as to better maintain the material within the optimal and narrow temperature range (2:11-20).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Belcher (USPN 4988279) in view of Schwarzkopf (USPN 4642043) and further in view of Takahashi (USPN 6320014). Belcher and Schwarzkopf teach the subject matter of Claim 1 above under 35 USC 103(a).

As to Claim 4, Belcher appears to be silent to the claimed particle size. The Examiner asserts that in this case the size of the particle fed into a melt extruder does not materially affect the claimed process, and that any particle size would have been prima facie obvious to the ordinary artisan. However, Takahashi also teaches pellets having an average diameter of 5 mm comprising polyethylene terephthalate (10:10-15). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Takahashi into that of Belcher in order to a) provide a dry feed line of material to an injection molding machine or extruder, b) provide pellets that are prevented from scorching, and c) to provide bottles of polyester having excellent properties such as high strength (All are found in Takahashi, 14: 49-62)).

(10) Response to Argument

Appellant summarizes the Examiner's position on page 6 to be that cooling of the melt traveling through the mold fulfills the claimed cooling step because it occurs before solidification of the preform, which the Examiner interprets to be "forming". However, Appellant argues on pages 6 and 7 one of ordinary skill in the art would understand that material traveling through a mold prior to solidification to be "forming", and therefore cannot be interpreted to be the claimed step of cooling.

The Examiner maintains the position that molten material traveling through a cooled mold fulfills the broadest reasonable interpretation of "cooling", and that the subsequent solidification of that material in a shape is a "forming" step. The word "forming" implicitly requires a form or shape, and it is submitted that a forming step is not performed in the Bright process until the material solidifies in a mold. Appellants arguments assert that molten polymer traveling through a mold is "formed" upon introduction to a mold (Page 7, lines 1-3). However, if it is interpreted that entry of molten polymer into a cavity is a step of "forming", consistent with Appellant's interpretation, it is submitted that holding a reservoir of polymeric material in a molten state or transportation of molten polymeric material through a pipe could also be interpreted as a step of "forming".

Appellant's assertion (page 7 of the brief, lines 1-2) that one of ordinary skill would understand that a polymer stream is formed upon introduction to a mold is contradicted by Hata's teaching of passing material through a hot runner (Fig. 15, item 3) and a cold runner (Fig. 15, item 5) within a mold (21:54-68 and Fig. 15, item 1, including 1A,1B,1C) prior to solidification in the mold.

Appellant argues on page 7 that Bright describes cooling the extruded polymer in only one location, namely, in the mold. Appellant further argues that Bright does not suggest cooling a polymer melt stream by exchange with a liquid heat transfer medium. Appellant further argues that Bright describes cooling a mold into which a molten plastic is injected, but that there is no implicit disclosure of cooling the melt stream at least 20 C prior to being formed.

This argument flows from Appellant's interpretation that the material is formed upon entry into the mold. However, in the Examiner's interpretation, the polymer melt is cooled while traveling through the mold prior to the step of forming (solidification). Bright teaches a chilled heat transfer liquid (1:63-68) at a temperature of less than 10 C (1:68) which is used to cool the mold. The molten material travels through the mold prior to solidification, and would therefore be cooled. Bright teaches that it is necessary that the molten material in the plasticating unit be cooled very quickly upon injection into the mold to a temperature of less than 100 C so as to avoid crystallite growth (1:55-60). Therefore, it is submitted that the cooling of the flowing melt by at least 20 C would have been implicit or obvious to the ordinary artisan over the method of Bright.

Appellant argues on pages 7 and 8 that Hata teaches heating the resin. Appellant further states that the Examiner has cited Hata as teaching flakes, a screw extruder, and cooling a melt stream to a temperature of at least 20 C, citing the Final Rejection at page 2. Appellant further states that Hata is silent to flakes. Appellant further argues that Hata teaches away from the claimed process by providing a heated temperature adjusting portion (citing Fig. 15).

The Examiner firstly notes that the Appellant's argument is factually incorrect when it states that Hata was relied upon for cooling a melt stream to a temperature of at least 20 C. The Hata method is discussed only in the last line of page 2 of the Final Rejection, and on page 3. Bright was relied upon for the implicit teaching or obviousness of the temperature drop. Hata merely teaches well known aspects of the injection molding process, namely feedstock and the extruder.

The term "flakes" is defined in the instant specification to be generally <u>commercially available</u> "flakes, chunks, sphere, pellets, and the like" (Specification, page 4, lines 12-13). In view of Hata's teaching that a hopper and feedstock are necessary, and the commercially available nature of pellets, it is submitted that pellets would have been an obvious choice as a feedstock material. It should also be noted that a particular size "flake" is also disclosed in the specification at page 4, line 16. However, this limitation should not be read into the scope of the independent claims in view of Claim 4, which would be redundant if the polymer flakes were always required to have the particular size disclosed by the specification.

With regard to the assertion that Hata teaches away from the invention by providing a heated temperature adjusting portion, it is noted that Appellant's cite to Fig. 15. This figure is described in the text at 21:54-68. Appellant argues that the heated portion teaches away from the invention without addressing the teaching of a "cold-runner portion 5" which is "formed in the split mold 1B" (21:63). The cold-runner follows the hot-runner. The claim scope does not exclude any unrecited steps, such as the hot runner of Hata, and in view of the cold-runner type which follows the hot-runner, it is asserted that there is no teaching away from Appellant's claimed invention.

Additionally, Appellant argues that Hata teaches that extruded polymer can be heated by a heater in a temperature adjusting portion before it is injected into a mold cavity where it is subsequently cooled (Appellant's brief, page 8, lines 9-11). However, this argument is inconsistent with the Appellant's arguments above directed to the Bright reference. Appellant asserts on page 7, lines 1-2 of the brief that one of ordinary skill in the art understands that a polymer stream will be "formed" upon introduction to a mold. Note that Hata describes the

mold (1) to be composed of three split portions (1A, 1B, 1C), and that the temperature adjusting portion (3) is contained within the mold (1C). This teaching by Hata, as one skilled in the art, contradicts Appellant's assertion that "a polymer stream will be 'formed' upon introduction into the mold." (Appellant's brief, page 7, lines 1-2).

Appellant argues on page 9 that Takahashi discloses polyester pellets, but does not disclose a step of preparing a blow molding preform, and is therefore not properly combinable.

The Examiner firstly notes that Appellant's argument appears to be factually incorrect when it states that Takahashi does not disclose a process for preparing a blow molded preform. Takahashi teaches polyethylene terephthalate (PET) at 6:33, "injection molding" and a "preform" (30:11-12), and "blow molding" (30:24-25). Therefore, it is asserted that the Takahashi reference is at least within the same field of endeavor. Additionally, it should be noted that the Takahashi reference was provided only to show that the "polymer flakes" disclosed to be "commercially available" in the instant specification at page 4, lines 10-16, are indeed known in the art.

With regard to the rejections over Belcher, Appellant summarizes the Examiner's position regarding the rearrangement of steps on page 10 and argues on pages 10 and 11 that these method claims impose a specific order on the performance of the recited steps. Appellant further argues that "These steps could not be performed other than in the order written." (Appellant's brief, page 11, lines 1-2).

However, Appellant's specification appears to contradict this assertion, stating that it is known to provide a reverse heat profile plasticating extruder, wherein the temperatures are hotter at the feed end of the screw and lower at the discharge or metering end of the screw (Specification, bridging pages 1 and 2). It is submitted that in the conventional process disclosed in Appellant's specification, forming would obviously occur after the metering end of the screw, thus providing substantially the same steps in a rearranged order (melt, cool, extrude, form). Appellant's invention therefore appears to be directed, at least partially, to resolving the inconsistent material feed to the extruder and erratic polymer melt pressure and flow at the outlet (Specification, page 2, lines 2-5) by cooling after extrusion and prior to forming. The rejection over Belcher and Schwarzkopf merely demonstrates that which Appellant's specification acknowledges to be known, namely the steps of melting, cooling, extruding, and forming. However, there is no factually supported objective evidence in the specification or elsewhere in the record which demonstrates that the result found by Appellant is unexpected.

MPEP 2144.04(IV)(c) continues to cite cases which support the conclusion that rearrangement of process steps and selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results. *Ex parte Rubin*, 128 USPQ 440 (Bd. App. 1959); *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946). In particular, the appealed claims in *Rubin* contained language which also recited a particular order by using the words "first" and "then", but were found to be obvious a patent containing the same steps in a reversed order without an unexpected result. *Rubin* at 441-442. In this case, Appellant's specification acknowledged that the process steps are know in a different order, and asserts an improvement resulting from the claimed order. However, there is no factually supported

objective evidence in the specification or elsewhere in the record which demonstrates that the result found by Appellant is unexpected over the known process (Specification, page 1, line 27). Appellant's cited case appears to pertain to infringement, and not to determination of obviousness.

With regard to any further arguments over the Schwarzkopf references, it is noted that Appellant's argument acknowledges the teaching in Schwarzkopf of fluid cooling the nozzle of an injection machine (Page 11, third full paragraph). Therefore, it is submitted that the reference teaches those elements lacking from Belcher, particularly fluid cooling of a melt.

Appellant argues on page 12 that Takahashi discloses polyester pellets, but does not disclose a step of preparing a blow molding preform, and is therefore not properly combinable.

The Examiner firstly notes that Appellant's argument appears to be factually incorrect when it states that Takahashi does not disclose a process for preparing a blow molded preform. Takahashi teaches polyethylene terephthalate (PET) at 6:33, "injection molding" and a "preform" (30:11-12), and "blow molding" (30:24-25). Therefore, it is asserted that the Takahashi reference is at least within the same field of endeavor. Additionally, it should be noted that the Takahashi reference was provided only to show that the "polymer flakes" disclosed to be "commercially available" in the instant specification at page 4, lines 10-16, are indeed known in the art.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Matthew J. Daniels

Conferees:

Christina Johnson

CHRISTINA JOHNSON
SUPERVISORY PATENT EXAMINER

/Jennifer Michener/

Quality Assurance Specialist, TC1700

Jennifer Michener